BULLETIN

OF THE

UNIVERSITY OF TEXAS

1915: No. 71

DECEMBER 20 1915

Status of Manual Training and Domestic Economy in the Secondary and Higher Schools of Texas

BY

O. A. HANSZEN

Adjunct Professor of Manual Training
and
Assistant Visitor of Schools

Published by the University six times a month and entered as second-class matter at the postoffice at
AUSTIN, TEXAS

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The benefits of education and of useful knowledge, generally diffused through a community, are essential to the preservation of a free government.

Sam Houston.

Cultivated mind is the guardian genius of democracy. . . . It is the only dictator that freemen acknowledge and the only security that freemen desire.

Mirabeau B. Lamar.

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PREFATORY NOTE

The need of preparing this bulletin was indicated by the large number of requests, received by the University, for information concerning the practical arts courses in the public schools. These requests came from teachers, school officials, dealers in apparatus and supplies, and from other persons interested in education closely related to the industries and the home.

In collecting the material which has been included the writer tried to obtain accurate information directly from the schools represented. Questionnaires were sent to all schools and some response was received from all except a few schools, but a number of schools were unable to give all the facts asked for. The writer obtained much of the data from the files of the State Department of Education.

The writer wishes to express his appreciation to every one who has in any way contributed any material. He is especially indebted to the State Superintendent of Public Instruction for the data obtained through his office.

O. A. HANSZEN.

HISTORICAL DEVELOPMENT

In the fall of 1896 the Allan Manual Training School of Austin, the first manual training school in the State, was opened to students, and classes in mechanical drawing and wood work were organized. This Department was established, by the Austin Board of Education, as a part of the public school system in order to comply with the provisions of the will of a public spirited citizen, John T. Allan. Mr. Allan left an estate of about $50,000.00 to be used in founding and maintaining the Department.

The excellent work done by this Department from its very beginning, the attractive equipment, and the spirit of those in charge of the school, soon brought people to Austin to study this form of school work. As a result of this and because of the rapid spread of manual training in a few other states, a demand was created for manual training in many of our city high schools. Very little was done, however, toward meeting this demand, until the Legislature made an appropriation for the purpose in 1903. In that year several schools began teaching manual training.

Domestic economy was not taught in any Texas schools prior to 1903, but on that date, the Girls' Industrial School, now the College of Industrial Arts, at Denton began its first school term. To the wonderful success of the work in that school is due, to a great extent, the rapid growth of the domestic economy work in the public schools.

The first state aid for domestic economy received by any public school in the State was in 1909. The schools which have received state aid for manual training and for domestic economy, and the year in which the first aid was granted to each school, are shown in Table I.

Very little progress has been made in the introduction of manual training and domestic economy in the elementary schools. This is due, no doubt, to the fact that the legislative appropriations have always been made for the high schools and because the high school work seems, to the average person, to be of a more practical nature,—produces some articles of value, is closely related to some industry, and makes a good display,—while the value of the elementary work is not so generally appreciated.

Only a few schools have any extensive manual training or domestic economy work of any kind below the first year of the high school, yet one of the most urgent needs of our public school system today is the introduction of some of the manual arts and household arts in the upper elementary grades as a means of general education, and as a means of pre-vocational training and vocational and educational guidance. A few cities, namely, Houston, San Antonio, Fort Worth, and El Paso, are making progress with the work below the high school. The success of the work in these places is beginning to develop a demand for similar work in other places.

Prior to 1909 the only training school for teachers of manual training and domestic economy was the College of Industrial Arts, but in 1909 the training of teachers for this work was started at the Sam Houston Normal Institute at Huntsville. Today all of the State Normal schools are training teachers for the work in the elementary and secondary schools. The School of Domestic Economy of the University of Texas was established in 1911. The School of Manual Training was established in 1914. The work in the secondary schools has been growing so rapidly that the six schools preparing teachers have been unable to supply all the trained teachers needed. Table V partially shows the excellent facilities of these schools for the training of teachers. These facilities are ample for the training of many more teachers than are now needed.

The drawing and shop courses adopted by our schools, up to 1902 or 1903, were very largely modelled after the work of the Manual Training School of Washington University and of the public schools of St. Louis and Kansas City. These model schools, like most other American schools of that time, were following the Russian method of handwork instruction. Therefore, in our early schools the pupils were put to making a great many exercises or abstract problems which were well designed to develop skill, but little more. Beginning with 1903, the Sloyd idea of constructing useful models gained favor, and soon the majority of our schools were having pupils build many useful models, mostly designed by the teacher, or made from designs found in some text book. This is the plan or scheme of work found today in most of our schools. Some schools retain a great many of the old exercises, many more than desirable.

LEGISLATIVE APPROPRIATIONS

The State Legislature has appropriated a total of $379,000 for the purpose of aiding high schools in establishing, equipping and maintaining departments of manual training, domestic economy, and agriculture. These appropriations were made as follows:

By the 28th Legislature in 1903	$ 10,000.00
By the 31st Legislature in 1910	69,000.00
By the 32nd Legislature in 1911	100,000.00
By the 33rd Legislature in 1913	100,000.00
By the 34th Legislature in 1915	100,000.00

All of this money, with the exception of the last appropriation, has been awarded. However, a few of the schools awarded state aid did not use the money, and so returned it to the State Department of Education.

Under the present regulations of the State Board of Education any equipment purchased with the money received from the State appropriation becomes the property of the State Board of Education whenever the high school discontinues the instruction in the subject for which the money was awarded.

Fifty thousand dollars, or one-half of the money appropriated by the 34th Legislature, is now available for agriculture, domestic economy and manual training. The law providing for the appropriation and for its regulation follows:

"For continuing State aid in such high schools as have heretofore established departments of agriculture, manual training, or domestic economy; provided, that the inspector from the State Department of Education, after visiting said high schools, finds further State aid advisable and necessary, and recommends it; and for establishing, equipping and maintaining such departments in additional high schools in accordance with the provisions of Section 3, Chapter 26, General Laws, Regular Sesssion, Thirty-second Legislature, $50,000." Section I, Chapter 34, General and Special Laws, First Called Session, Thirty-fourth Legislature.

Chapter 26, Section 3, follows:

"SEC. 141. *State Aid.*—It shall be the duty of the State Board of Education to duplicate by an appropriation out of money provided for by this Act an amount not less than five hundred ($500.00) dollars, nor more than fifteen hundred ($1,500.00) dollars, that shall have been set apart by the trustees of a public high school of the first class or of the second class, the establishment of which is herein authorized, or any such high school that has already been established in either a common school district or an independent district, for establishing, equipping and maintaining a department of agriculture; an amount of not less than five hundred ($500.00) dollars, nor more than one thousand ($1,000.00) dollars, that shall have been set apart by the trustees of any such high school for establishing, equipping and maintaining a department of domestic economy; and an amount of not less than five hundred ($500.00) dollars, nor more than one thousand ($1,000.00) dollars that shall have been set apart by the trustees of any such high school for establishing, equipping and maintaining a department of manual training; an amount of not less than five hundred ($500.00) dollars, nor more than one thousand ($1,000.00) dollars that shall have been set apart by the trustees of a public high school of the third class in a common school district for establishing, equipping and maintaining a department of agriculture; *provided,* that not more than two thousand ($2,000.00) dollars shall be appropriated by the State Board of Education for the purpose mentioned to any one high school during the same scholastic year; and *provided further,* that such appropriation shall not be made more than twice to the same school. The board of trustees of the high school applying for State aid for establishing, equipping and maintaining a department of agriculture, domestic economy or manual training shall provide ample room and laboratories for the teaching of each subject or subjects, and in connection with the department of agriculture in the high school, shall provide a tract of land, conveniently located, which shall be sufficiently large and well adapted to the production of farm and garden plants, and shall employ a teacher who has received special training for giving efficient instruction in the subject. The State Superintendent of Public Instruction shall make accurate and full investigation

of the school property, appliances and ground possessed by any board of trustees that may apply for State aid under the provisions of this Act, and shall make a report of the result of his investigation to the State Board of Education, together with his recommendations touching the same. The State Board of Education shall grant aid to those high schools that have complied with the provisions of this Act, that shall give evidence that, after the State aid is withdrawn, the high schools will continue to maintain the department for instruction in agriculture, domestic economy, or manual training, and that have been recommended by the State Superintendent of Public Instruction. [Acts 32nd Leg., Chap. 26, Sec. 3.]

SCOPE OF MANUAL TRAINING AND DOMESTIC ECONOMY

Manual Training from an educational viewpoint is the training of the child through those activities which find their fullest expression in the products of the material arts. As a form of school work Manual Training may be defined as any subject which provides practice in the manipulative processes of the practical material arts and industries. According to these definitions, such subjects as clay work, pottery, basket-making, book binding, printing, mechanical drawing, wood-work, metal work, concrete work, and some of the subjects included in domestic economy, as sewing, weaving, and dress-making, are manual training subjects. The plan of classifying all subjects closely related to the study of the home or to the training for home making as domestic economy subjects, is quite universally adopted, and is, for many reasons, the more desirable. The purpose of the instruction determines the subject in the course. Hence, home architecture, house plans, decorative design, weaving, and wood finishing, may be found in both the manual training and domestic economy courses. "Manual Training in the upper grades and high school, as the term is now used, applies mainly to wood and metal working, including printing, book binding and various forms of construction work as arranged for boys from twelve to sixteen years of age".[1] Well organized courses in bench wood work, furniture making, pattern making, forging and machine shop practice, and technical drawing, are found in many of our schools. In a few schools girls are permitted to take wood work, or a special manual training course is provided for them. Also in a few schools boys are enrolled in the Domestic Science classes.

Suggestive courses of study and full outlines of manual training subjects for high schools are given in Bulletin No. 327 of the School of Manual Training of the University of Texas. The majority of high schools in the State are conducting their work in accord with the suggestions made in this bulletin. In Table

[1]Report of Committee on Terminology, N. E. A., 1914.

No. IIIa is shown the time given to various manual training subjects in a few of the well organized schools.

Domestic Economy or "Home Economics as a distinctive subject of instruction is the study of the economic, sanitary, and aesthetic aspects of food, clothing and shelter, as connected with their selection, preparation and use by the family in the home or by other groups of people."[2] Bulletin No. 98 of the University of Texas gives a complete syllabus of domestic economy for the elementary and secondary school. The syllabus was compiled by the Texas Home Economics Association and it is quite extensively followed by the high schools. The outlines from typical schools, on the following pages, have been planned so as to use the syllabus.

Individual teaching, always a striking feature of handwork instruction, is followed in nearly all of the high schools. It is desirable and highly efficient, but the adjustment of the work itself to individual needs should go along with individual instruction. The usefulness of the finished work and the nature of the child indicate very strongly that not only the teaching, but the subject matter as well, should be individual. Up to the present time, however, very little has been done in this direction beyond giving the pupil a chance to choose one of a group of models. In most cases the design or working drawing of the model is furnished by the teacher. The San Angelo high school and a few others are making progress in solving this problem of adjusting the work to the student, and they are obtaining better interest, proper motivation, and a higher standard of work.

The demand for vocational training is being felt in a few large centers, and efforts are being made to meet this demand, but so far there is little difference between the vocational or industrial training and well taught standard manual training, with the exception, possibly, of the work in San Antonio. The stress being placed upon the vocational aim of the manual arts instruction is gradually bringing about changes in the course of study and in the time devoted to the work. The manual training and domestic economy departments of our schools are exceptionally well equipped to meet any demands made for vocational training in the vocation allied to the kind of work done in these departments.

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[2]Definition from the syllabus of Home Economics, American Home Economics Association, 1913.

HIGH SCHOOL PROGRAM OF STUDIES

BONHAM HIGH SCHOOL

Latin Course	Science Course
Eighth Grade	
English (5)	English (5)
Algebra (5)	Algebra (5)
Select Two:	Select Two:
Manual Training (5)	Botany (5)
Domestic Economy (5)	Manual Training (5)
Physiology (5)	Domestic Economy (5)
Latin (5)	Physiology (5)
Ninth Grade	
English (5)	English (5)
Algebra (5)	Algebra (5)
History (5)	History (5)
Select One:	Select One:
Domestic Economy (5)	Zoology (5)
Manual Training (5)	German (5)
Latin (5)	Manual Training (5)
	Domestic Economy (5)
Tenth Grade	
English (5)	English (5)
Geometry (5)	Geometry (5)
History (5)	History (5)
Select One:	Select One:
Latin (5)	German (5)
Manual Training (5)	Manual Training (5)
Domestic Economy (Sewing) (5)	Domestic Economy (Sewing) (5)
Physics (5)	Physics (5)
Chemistry (5)	Chemistry (5)
Eleventh Grade	
English (5)	English (5)
History (5) and Civics (5)	History (5) and Civics (5)
Select Two:	Select Two:
Latin (5)	German (5)
Physics (5)	Physics (5)
Chemistry (5)	Chemistry (5)
Domestic Economy (Cooking) (5)	Domestic Economy (Cooking) (5)
Manual Training (5)	Manual Training (5)
Solid Geometry (5)	Solid Geometry (5)

Two courses in science will be required of all pupils.

Note.—The figure following the subject indicates the number of recitations a week.

PROGRAM OF STUDIES OF THE SAN MARCOS HIGH SCHOOL

I.

English 5P
Algebra 5P
Ancient History 5P
Latin 5P
Physiography .....3P+
Manual Training with
Drawing .....4 double P
Dom. Economy...4 double P

II.

English 5P
Algebra 5P
Med.-Mod. History 5P
Latin 5P
Spanish 5P
Physiology 3P
Manual Training with
Drawing .....3 double P
Dom. Economy...3 double P

III.

English 5P
Plane Geometory 5P
English History 5P
Latin 5P
Spanish 5P
Chemistry .....5P+
Manual Training with
Drawing .....3 double P
Dom. Economy...3 double P

IV.

English 5P
Plane Geom. and Solid
Geom. 5P
American History and
Civics 5P
Latin 5P
Spanish 5P
Physics .....5P+

Note.—P indicates a recitation or laboratory period of 40 minutes.

BONHAM HIGH SCHOOL, OUTLINE OF DOMESTIC ECONOMY COURSE

Domestic Science

First Year

1. Necessary preparation for work by pupils.
2. Explanation and care of equipment.
3. Lecture on care of equipment.
4. Study of water:
    a. Kinds and uses.
    b. Lecture on beverages.
    c. Preparation of tea and coffee for market.
    d. Process of preparing tea and coffee to drink.
5. Outline of food principles.
6. Study of the range.
7. Study of fruits:
    a. Dietetic value.
    b. Preparation of baked apple.
    c. Preparation of cranberry jelly.
8. Study of carbohydrates:
    a. Experiments showing effect of temperature upon starch.
    b. Cereals:
        1. Steaming of cereals.
        2. Boiling of cereals.
        3. Cold cereal molded.
    c. Study of potato:
        1. Microscopic examination of thin slice of potato.
        2. Preparation of potato for table by baking and serving in the half-shell.
9. Study of protein foods:
    a. Eggs:
        1. Nutritive value and digestibility.
        2. Care and preservation of eggs.
        3. Experiments showing effect of temperature on eggs, including eggs cooked in the shell, poached eggs, omelet, scrambled eggs, and eggs a la Golden Rod.

b. Milk:
   1. Care of milk.
   2. Nutritive value and digestibility.
   3. Preparation of White Sauce.
   4. Cream soups.
   5. Preparation of junket for experiments and for eating as dessert.
   6. Preparation of cottage cheese.

c. Cheese:
   1. Source.
   2. Manufacture.
   3. Varieties.
   4. Nutritive value and digestibility.
   5. Experiments showing effects of temperature.
   6. Preparation of Welsh Rarebit, Creamed Cheese, and Cheese Foundue.

10. Combination of Food Materials:
   a. Breads: quick breads; yeast breads.
   b. Pastry:
      1. Digestibility.
      2. Principles underlying making of desirable pastry.
      3. Preparation of lemon and apple pie.
   c. Cake:
      1. Classification of cakes.
      2. Preparation and rules for each.
      3. Steaming: Principles underlying cooking by steam; preparation of Boston Brown Bread.

11. Proteins (Continued):
   a. Meats:
      1. Structure.
      2. Nutritive value and digestibility.
      3. Study of cuts of meat.
      4. Study of effect of temperature upon meat.
      5. Cooking of meat out of water.
      6. Cooking of meat in water.
      7. Cooking of meat partly without and partly within water.

b. Gelatin:
   1. Source.
   2. Manufacture.
   3. Nutritive value and digestibility.
   4. Preparation of gelatin desserts.

c. Poultry:
   1. Nutritive value and digestibility.
   2. Selection of poultry.
   3. Tests of age, quality, and freshness.
   4. Dressing, cleaning, and cutting of poultry.
   5. Preparation of chicken fricassee.

12. Serving:
    1. Simple breakfast prepared and served.
13. Fats and Oils:
    a. Source.
    b. Nutritive value and digestibility.
    c. Preparation of croquettes.
    d. Talk on use of left-overs and use of breadcrumbs.
    e. Methods of applying fat-proof coating.
14. Salads:
    a. Lecture on salads in the diet.
    b. Preparation of salads, cooked mayonnaise, French dressing. Attractive appearance of salad stressed.
15. Study of Vegetables:
    a. Classification of vegetables.
    b. Nutritive value and digestibility.
    c. Preparation of creamed potato, creamed cabbage, scalloped corn and squash.
16. Ices:
    a. Study of principles of freezing.
    b. Preparation of lemon sherbert.

Second Year

1. Food principles (continued).
2. Study of fruit:
   a. Function of fruit in the body discussed.
   b. Experiments showing influence of mold, yeast, and bacteria upon fruits under different conditions.

c. Preservation of fruit:
   1. Study of best methods for producing steril fruit in sterile air tight jars.
   2. Canning, preserving, pickling, and jelly-making done by class.

d. Preparation of cooked fruits, as "Brown Betty".

3. Carbohydrates:
   a. Study of sugar.
   b. Functions of sugar in the body.
   c. Study of starches:
      1. By applying iodine to starch solution cooked to different stages, starch digestion is illustrated.

4. Vegetables:
   a. Classification of vegetables according to composition and structure. Time table for cooking them made.
   b. Preparation of baked beans, spinach, and vegetable salads.
   c. Lecture on what to plant in the home garden.

5. Combinations of food materials:
   a. **Breads:**
      1. Quick breads:
         Preparation of cream puffs, waffles, muffins, soft dough, cookies, cakes, and wafers.
      2. Yeast breads:
         Study of yeast by microscopic examination, experiments made showing effect of temperature on the growth of yeast.
         Practical work, consisting of making loaves of bread, Swedish cinnamon, finger rolls, and coffee cake.
      3. Pastry:
         1. Review of plain pastry making.
         2. Preparation of puff paste.
      4. Steaming:
         Preparation of date pudding.

6. Protein:
    1. Eggs:
        a. Composition, care and preservation of eggs (reviewed).
        b. Digestibility, place of digestion and digestive juice discussed.
        c. Preparation of French omelet, sauffle, and other food mixtures.
    2. Milk:
        a. Dairying: modern methods of dairying studied; milk pasteurized by the class.
        b. Cream soups.
        c. Vegetables in white sauce.
    3. Cheese:
        a. Digestibility, place of digestion, and digestive juice which acts on cheese discussed and reference reading required in this connection.
        b. Preparation of some cheese mixtures.
    4. Meat:
        a. Cuts of meat (continued).
        b. Study of cold storage—results of cold storage on meats.
        c. Meat cooking continued.
        d. Soups made from stock.
    5. Gelatin:
        a. Digestibility, place of digestion, and digestive juice which acts upon it discussed.
    6. Fish:
        a. Classification of fish.
        b. Digestibility, place of digestion, and digestive juice which acts upon it discussed.
    7. Table serving reviewed. Serving of dinner to Board of Trustees.
    8. Fats and Oils:
        a. Deep fat frying.
        b. Tests for correct temperature of fat.
        c. Preparation of croquettes, fritters, and doughnuts.
        d. Salad—three lessons.

9. Beverages:
    a. Preparation of punch, grape juice, and review of making coffee.
10. Frozen Mixtures:
    a. Place of frozen mixtures in the diet.
    b. Sherbet.
        1. Preparation of milk sherbert.
    c. Desserts frozen by packing in mould.
11. Invalid Cookery:
    a. Preparation of a few invalid dishes for common diseases.
12. Preparation of picnic lunch.
13. Dietetics:
    a. Elementary work in making dietaries.
14. Household furnishing:
    a. Lectures on the influence of good taste and color harmony in the home. Plan of a convenient and artistic dining room. Plan for a home kitchen.

Third Year

1. Review of food principles.
2. Preservation of fruit.
3. Cookery of carbohydrates.
4. Cookery of proteins.
5. Cookery of fats.
6. Dietetics.
    a. Study of food requirements for adults, each girl making out her caloric requirement per day.
    b. Serving of meals, meeting caloric requirements of those served.
    c. List of foods 100 calories of which can be purchased for ½c, 1c, 2c, 2½c, and 5c.
    d. School luncheon a special study.
    e. Study of food requirement for infants and children.
7. Invalid cookery:
    a. Types of diet.
    b. Special feeding.

8. Hygiene of the home:
   a. Points in selection of location and building.
   b. Heating, lighting, and ventilation.
   c. Water supply.
   d. Milk supply reviewed.
   e. Disposal of waste.
   f. Care of home.
   g. Elimination of household pests.
9. The home:
   a. House planning and construction.
   b, Home finishing.
   c. Study of special rooms.
   d. Selection of furniture.
   e. Selection of textile fabrics used in furnishing the home.
   f. House management.

DOMESTIC ART

(Three double and two single periods per week)

First Year

1. History and occurrence of principal textile fibres.
2. Study of the four principal textile fibres.
3. Physical tests for fibres.
4. Microscopic examination of fibres of each.
5. Qualities of each material.
6. Note book made containing specimens of cotton and flax fibre, and the different processes until yarn is made.
7. Specimens of wool and silk fibre.
8. Study of trimmings adapted to cotton fabrics.
9. Practice work.
   a. Darning shown by filling hole with weaving stitch.
   b. Lawn apron made, using hemming, briar, running, and basting stitches, and hemstitching. Placing on of band, making of buttonhole and sewing on of button illustrated.
   c. Model, teaching hemmed and overhanded patch.
   d. Sewing bag, illustrating making of casing, decorative stitches, and reviewing some of plain stitches.

e. Study of household linens.
f. Pair of pillow cases or a laundry bag.
g. Drafting, fitting, and making of gown, skirt, combination drawers and corset cover.

Second Year

1. Study of the properties and treatment of the four principal textile fibres (continued).
   a. Method of shrinking.
   b. Testing of linen for adulteration.
   c. Removal of stains from cloth.
2. Making of shirtwaist by commercial pattern, computation of time and cost expended.
3. Making of embroidery scallop on small piece.
4. Study of the hygiene of clothing.
5. Making of one-piece street dress, computation of expense and time of making.
6. Making of tailored wool skirt, computation of expense and time of making.
7. Comparing cost, laundering, and wearing qualities of home made garments and factory made garments.

Third Year

1. Budget making for a family.
2. Study of labor question in connection with production of garments. Visit to local cotton mill.
3. Study of the history of costumes.
4. Study of costume design, each girl making drawings of costumes suited to her figure.
5. Making of one-piece woolen dress.
6. Study of decoration and applied design.
7. Making of lingerie dress.
8. Study of care and repair of clothing.
9. Making of simple party dress.

NAVASOTA HIGH SCHOOL MANUAL TRAINING OUTLINE

FIRST YEAR

Care and use of tools—Grinding, oil stoning, order, prevention of rust.

"Essentials of Woodwork", by Griffith, is put into the first year of the work that beginners may have at hand a ready reference for all operations. Five periods of ninety minutes each per week will be devoted to Manual Training work in the first year.

Group.	Process.	Problem.
I. Giving the first use of the saw, gauge, try square and rule.	Measuring. Squaring Gauging. Sawing. Boring. Making Dowel.	Magic Squares. Game Board. Counting Board. Laundry List.
II. Emphasizing the first use of the plane.	Planing: 1. Surface. 2. Side. 3. Two Dimensions. 4. Champfering.	Rope Wind. Swing Board. Hat Rack. Bread Cutting Board.
III. Teaching the first use of the chisel.	Vertical Chiseling. Gouging. Paring. Sharpening Chisel.	Shelf and Brush Rack. Tray. Sleeve Board.
IV. Involving "Form work" and the first use of the spoke shave.	Bow Sawing. Modeling. Sand papering.	Coat Hanger. Tool Handle. Canoe Paddle.
V. Finishing: Talks on wood finishing.	Scraping and sand papering, staining, filling, waxing, varnishing, etc.	Finishing of all projects and refinishing of one piece of old furniture.

Group.	Process.	Problem.
VI. The construction of objects by means of some form of groove joint.	Housing. Halving. Nailing. Carving. Finishing.	Water Wheel. Test Tube Rack. Book Rack. Flower-pot Stand. Loom. Box Trap. Bracket Shelf. Towel Roller.
VII. More exact work in planing in order to make a glue joint.	Planing Joints Glueing. Clamping.	Drawing Board. Bench Hook.
VIII. Construction by means of a mortise and tenon joint.	Laying out duplicate pieces. Cutting a mortise, sawing tenon, finishing.	Stool. Plant Stand. Taboret. Umbrella Rack. Table.
IX. Construction involving the mitre joint.	Planing parallel edges and sides. Use of mitre box. Laying out brace.	Mitre Box. Picture Frame. Box. Bracket.
X. Elementary cabinet making, involving the use of panel.	Plowing. Fitting. Putting on hinges.	Sewing Cabinet. Music Cabinet. Plate Rack. Screen. Book Case.
	SECOND YEAR	
I. Review of the fundamental tool processes taught in the first year High School in woodwork. Talks on design and construction.	Mechanical drawing of project. Bill of stock. Plan for cutting up a stock board. Cabinet-makers' method of working stock at bench.	Stool. Taboret. Book Shelves. Shoe polishing Box.
II. Design of a small piece of furniture, involving simple joint construction.	Preliminary free-hand working sketch of project, showing proper proportions and giving dimensions. Mechanical drawing from approved sketch.	Medicine Case.

Group.	Process.	Problem.
III. Design of a larger piece of furniture than would be included in Group II. Talks on constructive design and difficult construction.	Working sketch. Mechanical drawing from approved sketch.	Large Stool. Chair. Music Rack. Tables.
IV. Design of a cabinet involving paneling and door and drawer construction.	Tool and machine constructions for all details in furniture and cabinet making.	Wall Cabinet. Book Case. Chest of Drawers. Desk. Repair of Furniture.

TEXAS CITY HIGH SCHOOL MANUAL TRAINING COURSE

OUTLINE OF WOODWORK

(a) Bench Work:

1. Box construction with accurately fitted butt, rabbet and dado joints; fastening with brads and glue.
   New Tools—Nail set, hand screws.
   Problems—Stationery box, card catalogue case, half peck and peck measure, egg tester, knife and fork box.
2. Mortise and tenon joints—slip mortise and tenon, through mortise and tenon, blind mortise and tenon, and keyed mortise and tenon.
   New Tools—Mortise gauge, mortise chisel.
   Problems—Exercises.
3. Glued joints—butt, splined and doweled.
   New Tools—Plow, winding sticks.
   Problems—Level stock, T square.
4. Miter joints—butt and splined.
   New Tools—Miter box, frame clamp.
   Problem—Exercise required. Picture or mirror frame, glove box, clock case, tray, etc.
5. Dove-tail joints—single halving, through multiple and lap multiple, veneering, inlaying, hinge setting.
   New Tools—Fret saw and frame, veneer press or clamps.
   Problems—Exercises, glove box, jewel box, tea caddie, tea tray, etc.

(b) Furniture and Cabinet Construction:

1. Review of principles and processes previously given.
   Problems—Tabouret with glued up top, mortise and tenon construction; combination footstool and shoe polish box, magazine stand.
2. Board construction, art metal trimmings.
   New Tools—Joiner, saw table.
   Problems—Music cabinet, cedar chest, settee with hinged top, etc.

3. Framed structures, fume and wax finish.
   New Tools—Band saw.
   Problems—Dining chair, arm rocker, etc.
4. Panel structures, drawer and drawer mechanism.
   Problems—Small cabinet, desk, etc.

Problems.	Drawing and Design.	Material.
(A) Bench work.		
(1)	Design and working drawing made by pupil from statement of requirements and limiting dimensions.	1″ poplar, gum or oak, s2s, to be resawn with rip saw. Good quality hide glue. Stain, shellac.
(2)	Free hand perspective sketches, by pupil, from working drawings of joints. Sketches to be in notebook.	Poplar or oak 2x2 rough stock. Stain, shellac, varnish.
(3)	Working drawings furnished to work from.	White pine, mahogany, etc.
(4)	Working drawings to be made from perspective sketches and principal dimensions.	Oak or mahogany stain, filler, varnish, pumice stone.
(5)	Working drawing and decorative design in color made by pupil.	½″ s2s of suitable wood. Birch, walnut, maple and mahogany veneer. Material for French polish.
(B) Furniture and Cabinet Construction.	Working drawings with full size structural detail given.	Cypress or oak. Stain and wax.
(1)	Outlines of top, legs, etc., and decorative design to be developed or altered by pupil.	
(2), (3), (4).	Original designs and working drawings by pupils. Requirements of model, structural details, and limiting dimensions developed by class.	Any suitable wood selected by pupil.

Each pupil is to construct a final piece of furniture.

Note.—Manual training woodwork is begun in the 5th grade in the Texas City Public Schools.

Problems.	Topics for Class Discussion or for Home Work.
(A) Bench-work.	
(1)	Re-sawing of lumber. Veneers. Kinds and quality of glue. Manufacture of glue. Flint and garnet paper, steel wool.
(2)	Choice of joints in construction. Structural design using joints as points of interest. Decorative treatment of joints. Varnish. Varnish finish. Rubbed finish. Machine-made joints.
(3)	Mahogany forests. Substitutes for mahogany. Imitations of mahogany found in furniture. Manufacturing method of making glued joints, built up stock as cores for doors.
(4)	Varnishes and varnish material. Rubbed and polished finish as used on pianos and other fine woodwork. Interior decoration.
(5)	Manufacture of rotary cut veneers. Veneer panels. Bending of wood after steaming. Decorative design.
(B) Furniture and Cabinet Construction.	
(1)	Joints and other details used in furniture construction. Interior decoration. Manufacture of furniture.
(2), (3), (4).	Furniture design and construction. Art metal work. Interior decoration.

THE MANUAL TRAINING COURSE, DALLAS MAIN HIGH SCHOOL, DALLAS

First Year

Mechanical drawing 135 hours.
Elementary woodwork 135 hours.

Second Year

Mechanical drawing 135 hours.
Furniture and cabinet making, or electives 135 hours.

Third Year

Machine drawing. Elements of design 135 hours.
Forging, one-half year 67 hours. Pattern making, one-half year 67 hours.

Fourth Year

Elective course in drawing including one of the following:

a. Advanced machine drawing 135 hours.
b. Architectural drawing 135 hours.
c. Structural drawing 135 hours.
d. Patent Office drawing 135 hours.

Machine shop practice 135 hours.

ALLOTMENT OF TIME

Each class spends an equal amount of time in shop and drawing room, alternating each week.

ELECTIVES

After a satisfactory completion of the work of the first year, at the discretion of the Principal of the High School and the head of the Manual Training Department, students may elect subjects for advanced work in the department, spending more time than stated above in any one subject.

OUTLINE OF MECHANICAL DRAWING COURSES

First Year

Freehand lettering.
Use of drawing instruments.
Scale working drawings.
Freehand sketches from objects.
Geometric constructions.
Conventional representations of materials.
Fundamental principles of design.
Theory of orthographic projection.
Inking, tracing, and blueprinting.
Line shading.

Second Year

Details of furniture construction.
Assembled drawings.
Study of perspective.
Isometric and oblique drawing.
Intersections of surfaces.
Intersections of solids.
Developments of surfaces.

OUTLINE OF MACHINE DRAWING

OUTLINE OF A ONE-HALF YEAR'S COURSE IN MACHINE DRAWING

Subject.	Contents.	Suggestive Problems.
1. Study of Machine Lettering.	Purpose. Operation. Design.	Steam Engine. Pump. Lathe. Power Saw. Gas Engine or Dynamo.
2. Sketching of Machine Parts. Lettering.	Classes of Drawings: Assembly. Detail. Diagrams. Erection.	Monkey Wrench. Globe Valve. Lathe Parts. Engine Parts.
3. Mechanism.	Use: Design. Construction. Odentographs. Motion Diagrams.	Levers. Belts. Gears. Cams.
4. Detailing.	Distribution of Parts. Arrangement of Plates. Indexing.	From Sketches made in Group II.

Subject.	Contents.	Suggestive Problems.
5. Checking.	Methods. Corrections.	Detail Drawing of Machine.
6. Assembly Drawing.	Assembly of Details.	Group 8, IV.
7. Special work in some particular line of drawing found in practice.	Mechanical. Electrical. Structural. Patent Office.	

OUTLINE OF WOODWORKING

FIRST YEAR—ELEMENTARY WOODWORKING

Group.	Processes.	Problems Suggested.
1. Emphasizing first use of plane.	Truing up face. Squaring one edge. Planing to dimensions.	Planing exercise in soft wood.
2. Giving first use of saw and laying-out tools.	Sawing to a line. Measuring. Squaring. Guaging. Boring. Chiseling.	Mortise and tenon joint in soft pine.
3. Form work. First use of coping saw.	Sawing curves. Duplicating parts. Chiseling grooves. Sharpening bevel edge tools.	Book stall. Small footstool. Bracket shelf.
4. Dowelled joints and use of screw-driver.	Use of templet. Boring for dowels. Boring for screws.	Small stand. Hat rack. Drawing board.
5. Mortise and tenon work.	Laying out joints. Fitting. Assembling.	Umbrella rack. Magazine rack. Telephone stand. Stool. Taboret.
6. Student's original design.	Principles of design. Application of design to problem.	Plate rack. Sewing room screen. Three fold screen. Small table. Simple chair.

OUTLINE OF WOODWORKING

SECOND YEAR—FURNITURE MAKING AND CARPENTRY

Group.	Processes.	Problems Suggested.
1. Review of principles.	Sharpening and use of tools. Layout of work.	Taboret with glued up top.
2. Use of power machine.	Sawing with band saw. Ripping and cross-cutting. Use of dado head. Machine boring. Safety devices.	Exercises.
3. Panelling.	Panel raising. Plowing. Grooving with dado. Fitting and gluing.	Medicine chest. Cedar chest. Wardrobe. Bookcase. Kitchen cabinet. Music cabinet. Victrola stand.
4. Advanced furniture and study of styles and design.	Machine jointing. Factory methods. Group working. Veneering.	Library table. Davenport. Hall seat. Porch swing. Desk. Chair—Morris. Chair—rocker.
5. House framing.	Use of the steel square in laying out timbers for frame. Erecting.	Roof frame. Model house frame. Section of house.
6. Finishing.	Fuming. Staining. Finishing.	Finishing models in 3 and 4.

COURSE IN DRAWING AND DESIGN, DALLAS MAIN HIGH SCHOOL, DALLAS

First Year:

Mechanical drawing 54 hours.

Freehand drawing 54 hours.

Study and practice in design 54 hours.

Application of design, to textiles, leather and bookbinding 81 hours.

History of art and art appreciation 27 hours.

Second Year:

Representation in various mediums 54 hours.

Study and practice in design 54 hours.

Application of design, to original models of metal, jewelry, and pottery 135 hours.

History of art and art appreciation 27 hours.

Note.—This course is essentially a manual training course for girls although boys are permitted to take the work.

MANUAL TRAINING GROUP.

Freshman Year.

	Units.
Agriculture (180)	1
Drawing (190) or Music (194)	1
Education (100)	1
English	3
Composition (113)	1
Grammar (110, 111)	2
History, Ancient (131, 132)	2
Mathematics	3
Algebra (142, 143)	
Geometry (144)	
Physical Education (198)	1
Physical Geography (150, 151)	2
Physiology (168)	1
Reading (109)	1
Total	16

Junior Year.

	Units.
Drawing, Mechanical (392)	1
Education (300, 301)	2
English	3
Composition (313)	1
Literature (317, 318)	2
Manual Training (376, 377)	2
Mathematics	3
Advanced Algebra (342)	1
Geometry, Solid (344)	1
Trigonometry (346)	1
Physical Education (398)	1
Physics (350, 351, 352)	3
Practice Teaching (308)	1
Total	16

Sophomore Year.

	Units.
Botany (260)	1
Chemistry (255)	1
Drawing, Mechanical (292)	1
Education (200)	1
English	3
Composition (213, 214)	2
Grammar (210) or Literature (217)	1
History (233, 236)	2
Manual Training (276, 277)	2
Mathematics	3
Algebra (242)	1
Geometry (244, 245)	2
Physical Education (298)	1
Physics (250)	1
Total	16

Senior Year.

	Units.
Analytic Geometry (444, 445, 446)	3
Chemistry (355, 356, 357)	3
Education (400, 407)	2
History, American (436, 437)	2
Manual Training (476, 477, 478, 479)	4
Physical Education (498)	1
Practice Teaching (408)	1
Total	16

14. *Electives*—There are no "free electives." Each student above the freshman class on entering must elect one of the seven courses offered. In the language and History-English courses there is an option of Latin, German or Spanish. *In all courses three units in either Manual Training or Home Economics may be, by permission of the president, substituted for the same number of units in other subjects.* In the same way, a sufficient number of foreign language units to satisfy university entrance requirements may be substituted for other units.

A unit is defined as the equivalent of four recitations a week for a term of twelve weeks. In all the courses every year's work consists of sixteen units.

Eleven units out of a total of 64 required for graduation may be manual training and drawing units.

DESCRIPTION OF SHOP AND DRAWING COURSES OFFERED BY THE SOUTHWEST TEXAS STATE NORMAL

FROM CATALOGUE 1914-15

The work of each year consists of two distinct parts—shop work, and mechanical drawing. Special attention is given to the latter and most of the work in the shops will be from drawings prepared by the students. All work produced is the property of the school but the students are allowed to retain their own work by paying the actual cost of the material used. Some outside reading and note book work will be required in most of the courses. Special attention is given to the work of planning courses, and selecting equipment for carrying on the work for schools of various kinds.

Manual Training 1. Elementary Wood Work and Mechanical Drawing.

A course for beginners. The construction, use and care of tools, and the reading and construction of working drawings receive special attention.

Manual Training 2. Joinery and Mechanical Drawing.

A continuation of Course 1. The work includes a study of materials used, methods of construction, and work in Geometric Constructions and Projections.

Manual Training 3. Cabinet Work and Mechanical Drawing.

A continuation of Course 2, with practice in larger constructions, and special attention to finishing. The work in Drawing includes Isometric and Cabinet Projections, and the design of articles to be made in the shop.

Manual Training 4. Advanced Mechanical Drawing.

Advanced work in Projections, Intersection and Development of Surfaces, and in elementary Machine Drawing.

Prerequisite: Manual Training 1, 2, 3, or 10.

Manual Training 5. Use of Wood Working Machinery.

Practice in using and caring for the different machines in the shop. Some large problems of construction will be taken up and each student will be expected to use and become familiar with each machine.

Prerequisite: Manual Training 1, 2, 3.

Manual Training 6. Furniture Design and Construction.

Each student will plan and prepare a complete set of drawings for some large piece, or set, of furniture, and then construct the articles in the shop.

Prerequisite: Manual Training 5.

Manual Training 7. Sheet Metal Work.

Practice in designing and constructing articles from thin metal, with particular attention to forming, riveting, and soldering. The metals used will include sheet iron, tin, brass and copper.

Prerequisite: Manual Training 1, 2, 3.

Manual Trai[redacted]nd 9. Forge and Machine Work.

These courses will not be offered during the session of 1915-16.

Manual Training 10. Elementary Mechanical Drawing.

A beginner's course open to any who wish to take work in Drawing without taking the shop work.

Prerequisite: Plane Geometry.

Manual Training 12.

Farm carpentry and concrete, may be taken in place of 3 or 6. This course is required of all students in agriculture.

Not more than 13 units out of the required 60 units for graduation may be manual training and drawing units.

DESCRIPTION OF HOME ECONOMICS COURSES, SOUTHWEST TEXAS STATE NORMAL

FROM CATALOGUE 1914-15

The subject matter of all the courses below is developed by means of reference work, lectures, and recitations, and is supplemented by abundant and varied laboratory practice. A well kept note book is also a part of each course. In Courses 1, 2, 3, 4, 5, 6, 7, and 11, the time of the student is divided equally between *Domestic Science* and *Domestic Art,* the two parts together constituting one unit of credit. *However, no student whose work is unsatisfactory in either part, will receive credit for the course.* All materials for work in Domestic Science and all materials for models in Domestic Art, are furnished by the department. *Students will furnish the materials for all the garments they make for themselves.* Courses must be taken in the order in which they are listed below.

Home Economics 1. 1 unit.

Domestic Science 1. Elementary Cookery.—This course aims to give fundamental knowledge of foods and their cookery, and to develop skill and efficiency in handling materials and kitchen equipment. Foods—their elements, classes and classification, digestion, and effect upon the body—are studied; and food values and costs are emphasized throughout the course.

Domestic Art 1. Elementary Sewing.—The general principles of sewing and the fundamental stitches—hemming, tucking, darning, buttonholing, etc.—are taught. Practice work on models precedes the making of each garment. A sewing apron is made by hand. The care and use of the sewing machine is taught. Suitable material and appropriate trimming for underwear are considered. A simple waist pattern is drafted and from this a corset cover pattern is developed, and the corset cover is then made by hand.

Home Economics 2. 1 unit.

Domestic Science 2.—This course reviews the five food classes and gathers the student's knowledge of them into a whole. More advanced work is given in studying food—its digestion, sources, composition, manufacture, classification—and food and economic value. The calorific value of the various foods are studied. Student's attention is turned towards grouping various class recipes so that they make a well-balanced meal.

Domestic Art 2.—Special attention is given to garment mending, with the idea that the student while in school will not only learn to sew and to teach sewing but also will be able to apply her knowledge in properly repairing and caring for her own clothing. The rest of the course is devoted to the practical use of the sewing machine. A pair of drawers are made from a commercial pattern. A pattern for a petticoat is drafted and the petticoat is made.

Home Economics 3. 1 unit.

Domestic Science 3.—Attention is given to planning of meals for an average family, and to instruction and practice in preparing and serving formal and informal dinners. Lectures are given on marketing and market prices; and on yeasts, breads, and flour mixtures, with practice in bread making. Practice work is given in general cookery.

Domestic Art 3.—In this course working plans for typical problems in constructive sewing are made; waist pattern drafted; night dress pattern developed; color and design as applied to wash dresses; making of a wash dress from copied or original designs. Also, some consideration of the general problems of the home is had; as, the works of the Consumer's League, the comparative cost of homemade and ready-made garments, etc.; and directions for cleaning fabrics.

Home Economics 4. 1 unit.

Domestic Art 4.—This course includes a study of ferments—bacteria, yeast, and molds—and fermentation in their relation to

food preservation. Practice is given in canning fruit and in preserving, jellying, and pickling. Study is made of the Pure Food Laws, and of the adulterants used in commercial products. Estimate is made of comparative costs of commercial and home-preserved products. Calorific values of foods are studied and practice is given in dinner serving, with balancing of dietaries and estimate of the cost of meals.

Domestic Art 4. Dressmaking.—This course includes the fundamental principles of dressmaking; drafting, making, and adjusting of patterns to measurement; the study of color harmony as related to dress; the study of costume designing, with emphasis on the hygienic, economic, and artistic phases in dress and trimming. Student provides, subject to approval of the instructor, suitable materials for a plain linen suit and makes it; and then provides materials and plans for a wool dress.

A study of the composition and characteristics of textiles begins here and runs throughout Domestic Art 4, 5, and 6.

Home Economics 5. 1 unit.

Domestic Science 5. Dietetics.—In this course a comparison of the nutritive values of common foods is made. Students calculate, prepare, and serve meals that furnish proper nourishment at definite costs.

Domestic Art 5.—The first part of this course completes the wool dress planned for in Course 4 above. The rest of the course is devoted to instruction in art needlework.

Home Economics 6. 1 unit.

Domestic Science 6. Therapeutic Cookery.—This course makes a study of the diet of invalids, in relation to the disease. Practice is given in the preparation of suitable food and in the arrangement of invalid trays.

Domestic Art 6. Millinery.—This course includes the planning, construction, and trimming of hats, beginning with the use of foundation materials. Students design and draft paper

patterns for hats, and then make hat frames from buckram and wire them, covering and trimming in various styles. Wire frames of given dimensions are constructed from approved models.

Home Economics 7. 1 unit.

Domestic Science 7. Advanced Cookery.—This course considers nutrition, making a study of food and its relation to the body. Practice cookery is had throughout the course.

Domestic Art 7. Tailoring and the History of Costume.—The history of costume, both ancient and modern, will be studied. The fundamental principles of tailoring in its hygienic, economic, and artistic phases will be considered. As practical work the student will design and make a tailored wool suit.

Home Economics 8. 1 unit.

Domestic Science 8. Home Sanitation and Management.—In this course the student plans a house, with special attention to plumbing, ventilation, lighting, heating, and furnishing. The course also aims to give a general idea of the management of the home, in the study of running expenses, general cost of living, division of labor, etc.

Domestic Art 8. Remodeling and Dressmaking.—This course includes the remodeling of a gown, and the selection, planning, and making of an evening gown.

Home Economics 9. Home Decoration. 1 unit.

This course will consider the history of furniture and furnishings; practical furnishing of today, with costs and estimates; principles of line, form, color; and the theory of color. Exhibits of such materials as are available will be used for illustration.

Home Economics 10. Home Nursing. 1 unit.

This course includes the furnishing and care of the sick room;

teaches remedies to be used in case of emergencies while waiting for a physician; and includes bandaging, keeping a record of symptoms, etc.

Home Economics 11. Equipments, Methods, Courses of Study. 1 unit.

This course includes the planning of courses of study in home economics in public schools; the cost of equipment; the cost of supplies; and methods of presentation.

Of the 60 units required for graduation 11 may be for home economics.

COURSES IN MANUAL TRAINING FOR TEACHERS, UNIVERSITY OF TEXAS

Courses 170w, 171s, and 161w, are intended for students preparing to teach shop work, mechanical drawing, and design in high schools.

History and Organization of Manual Training. (⅓ course.)

The introduction of formal instruction in hand work in the schools; the growth and development of manual training in European and American schools; systems and courses; the influence of industrial needs and aims; study of present day aims, courses, and methods; the economics of manual training. Prerequisite: Electrical Engineering 225 or Mechanical Engineering 201 (shop practice) and Drawing 201 or 15 (or four years' work in manual training in an approved high school); one course in education. 30 hours.

Methods of Teaching Woodwork. (⅓ course.)

The fundamental processes and elements of bench woodwork, cabinet and furniture construction, wood turning, pattern making, the planning and developing of problems, courses, and lesson plans; practice teaching. The student will be required to plan in detail one or more courses and to execute the principal problems. Prerequisite: Education 170w. 70 hours.

Mechanical Drawing for Teachers. (⅓ course.)

Mechanical drawing and design as applied to the manual arts. The use of special instruments; orthographic projections; perspective; tinting; principles of structural and decorative design; problems in furniture design; surface decoration; development of courses of study for high schools; methods of teaching. The prerequisites are the same as for Course 170w. 70 hours.

COURSES IN DOMESTIC ECONOMY, UNIVERSITY OF TEXAS

Catalog 1914-'15.

It is recommended that students who expect to take domestic economy in their sophomore year should fulfill their science re-

quirements by taking chemistry and zoology or botany in the freshman year. By completing these requirements in the freshman year, there will be greater opportunity for advanced work later.*

FOR UNDERGRADUATES

1. Foods: Selection and Preparation.

This course includes a study of food materials with reference to their composition, nutritive value, and cost; the fundamental cooking processes and their effect on the various foodstuffs used; the proper combination of foods; and the preparation and serving of simple meals. Recitations, lectures, and laboratory work. Prerequisite: Sophomore standing; Chemistry 1. 180 hours.

8. A. Foods and Their Preparation: Advanced Course.

In this course the preparation of foods is placed on a scientific basis. The principles of physics and chemistry are applied to cooking processes. Fuels and different methods of cooking are considered from the standpoint of economy of time and labor. State food products and methods best adapted to their preparation and preservation are emphasized. Two lectures and two laboratory periods. Prerequisite: Domestic Economy 1.

11. Food Composition and Digestion.

This course is designed to give students a clearer insight into the study of foods, by investigating their chemical composition, production, manufacture, and adulteration, as well as the chemical processes of digestion and absorption.

The laboratory work will consist of an analysis of food into its fundamental principles, and experiments on salivary, gastric, and intestinal digestion. Two lectures and two laboratory periods. Prerequisite: Sophomore standing; Chemistry 1. 180 hours.

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*Juniors and seniors of the sessions of 1914-1916 may count Domestic Economy 8, 113s, 212fw, and 217ws as advanced courses towards the B. A. degree, provided that not more than four courses be counted in Domestic Economy, not more than six in any combination of Domestic Economy with the Schools of Business Training, Journalism, and Music and the professional departments.

212fw. A. Dietetics: Advanced Course. (⅔ course.)

This is a lecture and laboratory course designed for students specializing in domestic economy. The fundamental problems of human nutrition are studied with reference to the determination of proper food requirements. A review of the physiology of digestion and the nutritive value of foodstuffs will be taken up. Dietaries for the family will be planned with reference to the income, age, and occupation of its members. Two lectures and two laboratory periods. Prerequisite: Zoology 1 or 16, and Domestic Economy 1 and 11. 120 hours.

113s. A. Nutrition: Advanced Course. (⅓ course.)

This course supplements the work in dietetics and provides an opportunity for investigating the laboratory methods used in determining the nutritive value of foods and the body's food requirement. 60 hours.

210ws. Home Economics. (⅔ course.)

This course treats of home economics with particular reference to industrial and sociological aspects; factors governing production and consumption in the home; division of the family income as determined by various standards of living. Prerequisite: Sophomore standing. Where practicable, Business Training 110f is recommended as a prerequisite. 60 hours.

15. The Manufacture and Selection of Clothing.

This course includes a study of textile fibres through microscopic examination and chemical and physical tests; a study of the development of textile raw material into the finished product, practice in the use of the sewing machine and its attachments, in the making of fundamental stitches, in the application of hand and machine sewing to simple underwear, shirtwaists, and skirts, in the drafting and use of commercial patterns, in original design and hand embroidery applied to clothing and household decoration, and in the repair of clothing; a study of the social, economic, and hygienic aspects of clothing; the application of art to dress through the study of the principles of design as regards line and harmony of tone and color. Prerequisite: Sophomore standing. 180 hours.

216fw. Costume Design. (⅔ course.)

This course will deal with the theory and practice of costume design. It includes a study of the laws of proportion and color harmony as they apply to dress. Lectures on historic costumes, color, and textiles. 120 hours.

217ws. A. Costume: Advanced Course. (⅔ course.)

This course will deal with the making of costumes from designs made in Domestic Economy 216fw. The adaptation of style, color, and textile design to the individual will be carefully studied, accurate account will be kept of the cost of the materials used and the time spent in the making of gowns, and the comparative cost of ready-made garments of similar quality and design will be estimated. Prerequisite: Domestic Economy 216fw and 15. 120 hours.

204fw. House Structure and Sanitation. (⅔ course.)

This course considers the sanitary requirements of the home, including lighting, heating, plumbing, and disposal of waste; the location of the home and study of the various building materials used in its structure with reference to their relative value and cost; the evolution of the home from the practical and aesthetic viewpoint; the style and details of the Egyptian, Greek, Roman, Gothic, and Renaissance periods of architecture and decoration as applied to the modern home. Prerequisite: Sophomore standing. Where practicable, Botany 29 is urged as a prerequisite or parallel course. 120 hours.

17. Interior Decoration and Furnishing.

Proportion and arrangement in wall spaces and furnishings; color appropriate to function and exposure; color harmony in furnishings, draperies, and other fittings. The influence of the Greek, Roman, Gothic, and Renaissance periods on the modern home; the suitability of periods to modern conditions; adaptation in draperies, wall treatment, and floor coverings. Prerequisite: Domestic Economy 204fw. 180 hours.

114. Art Principles and Appreciation. (⅓ course.)

A general survey of the structure and decorative features of the historic periods in architecture, sculpture, painting, furnish-

ing, and the lesser crafts, so as to deduce principles of construction, proportion, color harmony, and texture relations, and through the understanding and application of these principles to apply them to problems of modern life such as municipal plans and buildings, domestic architecture, and interior arrangements and decorations. Prerequisite: Sophomore standing. 60 hours.

Education 227ws. Section B. The Observation and Practice of Teaching Domestic Economy. (⅔ course.)

Lectures, readings, reports, and conferences, together with school-room observation and practice of teaching under the direction of the instructor. The course includes a thorough study of methods, the planning of courses of study, the relation of domestic economy to the school curriculum, and the planning of laboratory equipment. The school observation and practice of teaching ordinarily require one period daily for five days a week, but students are expected to have three consecutive free hours between nine and three o'clock throughout the week in order to facilitate making the teaching assignments. This course counts towards the teacher's diploma and is required for a certificate for teaching domestic economy. Prerequisite: Senior standing; Domestic Economy 1, 11, 15, and 204fw. 120 hours.

COURSES FOR THE TRAINING OF TEACHERS, COLLEGE OF INDUSTRIAL ARTS

MANUAL ARTS COURSE

Freshman Year.

Design+108 hours.
Freehand drawing+108 hours.
Mechanical drawing 18+18 hrs.
Descriptive Geometry 72 hours.
Wood work+54 hours.
Clay modeling+54 hours.
Basketry+36 hours.
Electives 324 hours.

Sophomore Year.

Mechanical drawing 54+54 hrs.
Design+72 hours.
Water Color+18 hours.
Wood work and wood carving 36+36 hours.
Wood work and wood finishing 18+18 hours.
Leather work+18 hours.
Book binding+54 hours.
Metal work+90 hours.
Electives 24 hours.

Junior Year.

Design+36 hours.
Interior decoration+36 hours.
Pottery+108 hours.
Furniture construction or furniture design 54+54 hours.
House construction and house plans 81 hours.
Special methods 54 hours.
Electives 384 hours.

Note.—The numbers at the right of the subjects indicate the number of recitation hours per year. Those preceded by + are laboratory hours, requiring little or no home work. The others represent class work requiring outside preparation.

Senior Year.

To be added next year.

HOUSEHOLD ARTS COURSE

Freshman Year.

Chemistry 54+54 hours.
Bacteriology 18+36 hours.
Cooking 27+54 hours.
Drawing+72 hours.
Design+36 hours.
English 81 hours.
History 54 hours.
Household accounts 9+18 hours.
Sewing+54 hours.
Poultry+18 hours.
Textiles 9+18 hours.
Wood working 9+54 hours.
Zoology 27 hours.
Physiology 27 hours.

Sophomore Year.

Botany 27+54 hours.
Chemistry 18+72 hours.
Cooking 27+72 hours.
Domestic sanitation 27 hours.
Economics 90 hours.
Psychology 54 hours.
Sewing 108 hours.
English 81 hours.
Ethics 27 hours.
Laundry and dry cleaning 9+18 hours.
Floriculture+18 hours.
House plans 9+54 hours.
Physics 9+36 hours.

Junior Year.

Economics 63 hours.
Dietetics 18+36 hours.
Home Nursing 54 hours.
Household physics 36+36 hours.
Interior decoration 9+36 hours.
Millinery+54 hours.
Sewing+36 hours.
Landscaping+18 hours.
Sewing+36 hours.
Sociology 54 hours.

Electives 99+108 hours.

Senior Year.

Domestic Art Group.

Language 81 hours.
Dressmaking 27+162 hours.
Textiles 27+108 hours.
Costume design 27+108 hours.

Electives 162 hours.

Domestic Science Group.

Language 81 hours.
Food Chemistry 18+108 hours.
Nutrition 18+72 hours.
Experimental cooking 12+144 hours.

Electives 297 hours.

Note.—Electives are subject to the approval of the Classification Committee.

TABLE I

STATE APPROPRIATIONS AND VALUE OF EQUIPMENT

Name of School	Date of Introducing		Date Given Up	Total Amount From State	Value of Equipment		M. T. In Grades
	M. T.	D. E.			M. T.	D. E.	
Abilene						400	
Alamo Heights	1913	1913		1000	2500	2500	5th, 6th and 7th
Alief	1914	1914		1000			
Anderson		1915				25	
Athens		1914		500		700	
Atlanta	1912			500			
Archer City		1914		1000			
Austin	1896	1904		500	10000	3500	
Bay City	1912	1913		2750	500	750	
Beaumont	1904	1910		1000	2300	1500	
Belton	1903		*	1750			
Ben Wheeler	1912			500	150		
Bishop	1914	1914		1500	600	500	5th, 6th and 7th
Blanco	1914	1914		1000	300	400	6th and 7th
Bonham	1910	1910		5750	1900	1300	
Brenham	1912	1912		2750	1000	800	7th
Bridgeport		1913		2750			
Brownwood	1908	1908	1914-15	5000	2250	1200	
Bryan	1910			750			7th
Buda	1912	1912	1914	5250		300	
Buna		1914		750		250	6th
Carrizo Springs	1914	1914		1250	2100	850	
Carthage		1911		2000		500	
Center	1905		*	500			
Chico		1911		2250		235	
Childress	1913	1913		1000	300	350	
Cisco		1915		750		750	
Cleburne		1912		1200		800	
Coleman		1912		500		325	
Comanche		1913		750		350	
Conroe	1911	1911		2500	900	600	
Cooper	1910	1910		5000	1000	650	
Corsicana		1913				1000	
Corpus Christi	1914	1918		500	4500	2000	7th
Cotulla		1911	*	1500		400	
Cuero	1906	1913		2000	2500	1450	7th
Dallas	1903	1904		500	7000	2000	
Decatur	1914	1914		1500			
Denison	1914	1914		1250	4000	3000	
Devine	1903	1915	**	1250			
Denton		1910				750	
Eagle Lake	1910	1910		5000	300	1000	Yes
Edgewood		1914		1250			
El Paso	1909	1909			16615	10225	5th, 6th and 7th
Farwell		1914		750	770		
Flatonia	1914	1914		1500			
Floresville		1913	1915	500		500	
Fort Worth	1902	1902		4500			7th
Franklin	1913	1913	1914	1000			
Gainesville	1914	1913		750	1225	1100	
Galveston	1909	1909			1200	300	4th, 5th, 6th and 7th
Garrison		1913	1915	1250			
Gatesville		1912		1250		400	
Goldthwaite		1914		750		250	
Greenville	1913	1913		1000	2000	1200	
Greenwood		1911		1750		50	
Hallettsville	1913			750	1200		7th
Hamilton	1910	1910	1914	5000			
Harrisburg	1912	1912		1500			5th, 6th and 7th
Harris County No. 21	1913	1913		1000			7th
Harris County No. 25	1912	1913		1000			
Haskell		1913		2250		1500	

TABLE I—*Continued*

Name of School	Date of Introducing		Date Given Up	Total Amount From State	Value of Equipment		M. T. In Grades
	M. T.	D. E.			M. T.	D. E.	
Hereford	1913	1913		1000			
Hillsboro	1913	1913		500	1650	900	6th and 7th
Honey Grove	1913	1913		1250	1250	1000	
Houston Schools	1906	1906			25550	20000	4th, 5th, 6th and 7th
Houston Heights	1912	1912		2000	1800	1500	
Huntsville	1912			1000		1000	6th and 7th
Indian Gap		1915				175	
Iola		1914		750		2300	
Itasca	1903			500			
Jacksboro		1913		1250			
Jacksonville		1913		500			
Jefferson		1912		500		500	
Jourdanton		1913		1250			
Kaufman	1904	1908		500	500	100	
Kerrville	1912	1912	1914	2000	700	300	
Kingsville	1914	1914		1250			7th
Kyle		1912		2750			
Longview	1912	1912		1000	1500	500	
Lubbock	1915	1915		1500			7th
Lufkin	1913	1913		750			
Madisonville	1912	1912	1914	1500			
Marlin	1905	1910		5500			
Marshall	1911	1911		2000	1600	1000	
Martin's Mill	1913			500			
Mineral Wells	1915			750			
McGregor		1911		750		400	
McKinney	1912	1911		1500			
Mineola		1914		750		500	
Moore	1913	1913		1000			
Morrill	1914	1914		1000			5th and 6th
Nacogdoches	1914	1914		1250			
Navasota	1911	1911		3000	1000	1250	
New Braunfels		1914		500		500	
North Fort Worth	1911	1911			2750	600	7th
Oak Cliff	1913	1913			1600	1200	
Our Lady of the Lake		1910				400	
Ozona	1914	1913		500	650	1450	6th and 7th
Paris	1906	1906		1750		1050	
Pilot Point	1910	1911	1915	5000	250	250	
Pittsburg		1915		750		1028	
Port Arthur	1909	1909		3250	3000	600	6th and 7th
Rhome		1915		1250			
Rosebud	1914	1914		1500			
Rosenberg	1913			500			
Roxton	1912			750			
Saginaw		1915				175	
Saint Jo		1914		750		750	
San Angelo	1911	1911		4250	3500	1500	7th
San Antonio	1900	1900		500	5000	1500	4th, 5th, 6th and 7th
San Benito		1914		1250		375	
San Marcos	1912	1912		3000	1600	1200	
Sherman	1903	1907		500	3000	1000	5th, 6th and 7th
Silverton	1911	1911		3000			
South Park	1908	1908		2000			5th, 6th and 7th
Spring Grove	1913			750			
Stamford		1912		800		350	
State Orphans Home	1914	1914			450	345	6th and 7th
Sulphur Springs	1911	1911		2000	418	625	
Swan		1912		1000			
Sweetwater	1913	1913		750	1400	1200	7th
Taylor	1904			500	1500		7th
Teague	1914	1914		750			
Temple		1911		1000			
Terrell		1911		1600		700	
Texarkana	1910	1910		4000	3200	400	7th
Texas City	1914	1914		750			5th, 6th and 7th
Three Rivers		1914		750			
Tröckmorton		1914		750			6th and 7th
Tuleta	1911	1911		3250			
Tyler	1914	1914		1250			

TABLE I—*Continued*

Name of School	Date of Introducing		Date Given Up	Total Amount From State	Value of Equipment		M. T. In Grades
	M. T.	D. E.			M. T.	D. E.	
Uvalde	1910	1911		5000			
Victoria	1915			500			
Van Alstyne	1909	1909	*	5750			
Waco	1905			500			
Waxahachie	1912	1912		2750	1500	1000	
Weatherford		1914		500		600	
Wichita Falls	1911	1911		3500			7th
Winnsboro	1911	1911		5000	1200	800	
Winona		1913		500			
Woodson		1915		1250		1000	
West		1915		500			
Wills Point		1915		500			
Yancy	1914			1250			

*Discontinued but date not given.

Of the 145 schools in the above table 85 have manual training and 118 have domestic economy.

TABLE II

ENROLLMENT OF PUPILS IN MANUAL TRAINING AND DOMESTIC ECONOMY COURSES, AND THE UNIVERSITY ENTRANCE CREDITS GRANTED

School	Percent of pupils belonging to the H. S. taking		No. of pupils taking		Credits granted to affiliated schools for			
	M. T.	D. E.	M. T.	D. E.	Shop W	Drwg.	D. S.	D. A.
Abilene		40		80			½	½
Alamo Heights	100	100	50	50				
Alief			12	8				
Athens		60		40				
Atlanta	100	100	27	35				
Austin	38.7	56.8	168	312	1	1	1	1
Bay City			47	39	½			
Beaumont	100	100	75	228	1		1	1
Ben Wheeler	50		14					
Bishop	100	95	65	60				
Blanco	100	100	37	43				
Bonham	100	100	37	43	½	½	½	½
Brenham	75.6	71.5	62	98	½		½	½
Bryan					1	½		
Buna		100		20				
Carrizo Springs	64	77	16	25				
Chico		35		12				
Childress	5	16	4	16	1		1	
Cisco		70		33			½	½
Cleburne		20		64			½	½
Coleman		33⅓		30			½	½
Comanche		50		60				
Conroe	60	92	24	18				
Cooper	82	74	18	20				
Corsicana		14		41			1	½
Corpus Christi	98	90	175	225				
Cotulla		45		18				
Cuero	58	43	52	39	1	½	1	1
Dallas and Oak Cliff	32	45	272	581	1	1	1	1
Dallas — Special course for girls	10		135					

TABLE II—*Continued*

School	Percent of pupils belonging to the H .S. taking		No. of pupils taking		Credits granted to affiliated schools for			
	M. T.	D. E.	M. T.	D. E.	Shop W	Drwg.	D. S.	D. A.
Denison	70	95	130	260	½		½	½
Denton		30		132			½	½
Eagle Lake							½	
El Paso	36	40	1092	1253	1	1	½	½
Floresville		80		80				
Gainesville	32	4	84	95	½		½	½
Fort Worth					1	1	1	1
Galveston	50	50	500	1000				
Gatesville		100		33				½
Goldthwaite		35		32				
Greenville	50	33⅓	60	60	½		1	½
Greenwood		50		14				
Hallettsville		32		160				
Harrisburg					½			
Haskell		50		34			½	½
Hillsboro	30	25	35	43	½		½	½
Honey Grove	50	43	30		½	½	1	½
Houston			3065	3589	1	1	1	1
Houston Heights	50	50	100	100	1		½	½
Huntsville	83		53		1			
Indian Gap		100		26				
Jacksonville		90		81				
Jefferson		60		35				
Jourdanton		95		11				
Kaufman	42	31			1			½
Kerrville	80		26					
Kingsville	40	44						
Longview	11	9	14	12				
Lufkin	40	28	30	25	½	½		
Marlin			67	154	1	1	1	1
Marshall	27	38	35	59	½	1	1	1
Martin's Mill	90		27					
McGregor		25		20			1	
McKinney	50	50	65	70	½		1	
Mineola	60		42				½	½
Moore	80	60	30	25				
Morrill	100	100	46	38				
Nacogdoches					½			
Navasota	70	50	12	38	½	1	½	½
North Fort Worth					1	½		
Oak Cliff			154	147	1	1	1	1
Ozona							½	½
Paris					½		1	1
Pittsburg							½	
Port Arthur					1	½	1	½
Rhome	80			13				
Rosebud	20	40	12	26				
Rosenberg	95		55					
St. Jo		90		30				
San Angelo	15	11	40	30	1	1	1	1
San Antonio	58⅓	60	1218	1786	1	1	½	½
San Benito		10		10			1	
San Marcos	75	50	48	55	1	½	½	½
Sherman	75	72	254	457				
Silverton	100	100	32	35	1	1	1	1
South Park	40	90	73	98	½			
Stamford	26			24			1	1
State Orphans Home	100	100	28	52				
Sulphur Springs							½	½
Swan	75	90	30	30				
Sweetwater	17	20	32	36	½			
Taylor	50		49		1	½		
Temple		20		90				
Terrell							½	½
Texarkana	25	40	51	91		½	½	½
Texas City	100	100	93	124				
Three Rivers		100		18				
Throckmorton		25		12				

TABLE II—*Continued*

School	Percent of pupils belonging to the H .S. taking		No. of pupils taking		Credits granted to affiliated schools for			
	M. T.	D. E.	M. T.	D. E.	Shop W	Drwg.	D. S.	D. A.
Tuleta	90	80	8	8				
Tyler								
Uvalde	60	60	65	105	1	½	1	1
Waco	50	70	166	337	1	½	1	1
Waxahachie	33⅓	34	100	108	½		1	1
Weatherford		75		110			½	½
Wichita Falls	30	50	122	189	1	½	½	½
Winnsboro	47	41	23	29	1		½	½
Winona		100		16				

TABLE III

TABLE SHOWING THE TIME DEVOTED TO MANUAL TRAINING AND DOMESTIC ECONOMY, BY PUPILS IN THE AFFILIATED SCHOOLS

School	Hours per year devoted to M. T.				Hours per year devoted to D. E.			
	1st Yr.	2nd Yr.	3rd Yr.	4th Yr.	1st Yr.	2nd Yr.	3rd Yr.	4th Yr.
Austin	240	240	240	240	240	240	240	240
Bay City	54	54			54	54		
Beaumont	144	144	144	144	144	144	144	144
Bonham	125	125	125	125	125	125	125	125
Bryan	240	240						
Childress	96	96					96	96
Cisco					216	216	216	216
Corsicana					240	240		
Corpus Christi	96	96	96		96	96		
Cuero	240	240	240	240	240	240	240	240
Dallas	270	270	270	270	270	270	270	270
Denison	126	126			126	126		
Eagle Lake					108	108	108	108
El Paso	162	162	162		162	162	162	
Floresville					48	48		
Fort Worth	270	270	270	270	270	270		
Gainesville	108	108			108	108		
Galveston	54				48			
Gatesville								48
Greenville	270	270			270	270		
Harrisburg	120	120	120	120	120	120	120	120
Harris County No. 21	105	105	105	105	105	105	105	105
Harris County No. 25	260	260	260	260	192	192	192	192
Haskell					240	240		
Hillsboro	240	240			240	240		
Honey Grove	96	240	240		96	240	240	
Houston	280	280	280	280	280	280	280	280
Houston Heights	240	240	240	240	120	120	120	120
Huntsville	240	240						
Kaufman	131	131	131	131				
Lufkin	270	270	270		270	270	270	
Marshall	240	240	192		240	240	192	
McGregor					72	72		
McKinney	240	240	240		240	240	240	
Mineola					135	135		
Nacogdoches	180	180						
Navasota	270	270	270	270	270	270	270	270
North Fort Worth	270	270	270	270	132	132		
Oak Cliff	270	270	270	270	270	270	270	270
Ozona	135	135			135	135		

TABLE III—*Continued*

School	Hours per year devoted to M. T.				Hours per year devoted to D. E.			
	1st Yr.	2nd Yr.	3rd Yr.	4th Yr.	1st Yr.	2nd Yr.	3rd Yr.	4th Yr.
Paris	48	48	120	48	48	48	240	144
Pittsburg					162	162	162	162
Port Arthur	144	144	144	144	144	144	144	144
San Angelo	200	200	200	200	200	200	200	200
San Antonio	135	135	135	135	240	240	240	240
San Benito							270	270
San Marcos	186	140	140		186	140	140	
Sherman	270	270	135		135	270	135	270
South Park	180	180	180	180	360	180	180	180
Stamford					190	190		
State Orphans Home	48	72	108	108	48	72	108	108
Sulphur Springs	48	48	48	48	48	48	48	48
Sweetwater	240	240	240	240	144	144	144	144
Taylor	135	135	135	135				
Terrell					135	135		
Texas City	144	144	144	144	144	144	144	144
Tyler	120	120			72	72		
Uvalde	150	200	200	200	150	200	200	200
Waxahachie	240	240	240		240	240	240	240
Weatherford					144	144		
Waco	270	270	270	270				
Wichita Falls	120	120	120	120	120	120	120	120
Winnsboro	120	120			120	120		

TABLE IIIa

Total number of hours devoted to drawing and to shopwork, and number of lessons for each topic:

Column A gives the number of lessons. Column B gives the total number of hours.	Austin High School		Bonham High School		Dallas High School		Fort Worth High School		Houston High School		San Antonio High School		Waco High School	
	A	B	A	B	A	B	A	B	A	B	A	B	A	B
First Year														
Drawing	90	135	36	54	90	135	90	150	---	48	---	120	180	135
Sketching					24	---	---	---	---	---	10	---	45	34
Lettering	30	45	6	9	12	---	---	---	3	5	10	---	20	15
Geometrical problems	15	23	15	23	12	---	15	25	15	23	24	---	15	11
Working drawings	45	68	15	23	24	---	50	83	14	21	45	---	95	71
Conventional representations							15	25					5	4
Shopwork	90	135	---	81	90	135	90	150	36	54	---	162	180	135
Bench wood work	60	90	40	60	45	63	45	75	3	5	36	---	150	112
Furniture problems	30	45	14	21	45	62	45	75	33	49	72	---	30	22
Second Year														
Drawing	90	135	36	54	90	135	90	150	---	108	---	120	180	135
Conventional representations												10		
Working drawings			5	8			45	75	6	9			45	34
Orthographic projections	45	68	31	46	47	---	---	---	64	96	45	---	---	---
Isometric and oblique drawing	15	23			26	---	30	50			15	---	---	---
Lettering	15	23							2	3	10	---	20	15
Shopwork	90	135	54	81	90	135	90	150	108	162	---	162	180	135
Bench work and joinery			25	38										
Furniture problems			29	44	90	135	90	150					180	135
Turning	45	68							54	81	54			
Art metal	45	68												
Pattern making and moulding									54	81	54			

TABLE IIIa—*Continued*

Column A gives the number of lessons. Column B gives the total number of hours.	Austin High Schcol		Bonham High Schcol		Dallas High Schcol		Fort Worth High Schcol		Houston High Schcol		San Antonio High Schcol		Waco High Schcol	
	A	B	A	B	A	B	A	B	A	B	A	B	A	B
Third Year														
Drawing	90	135	36	54	---	90	90	150	72	108	---	120	180	135
Intersections and developments	30	45	30	45	30	45	---	---	---	---	45	---	90	67
Higher geometric curves	---	---	---	---	30	45	30	50	---	---	10	---	10	8
Architectural drawing	60	90	---	---	---	---	---	---	---	---	45	---	---	---
Machine drawing	---	---	6	9	---	---	60	100	72	108	or 45	---	---	---
Shopwork	90	135	54	81	---	180	90	150	108	162	---	162	180	135
Forging	90	135	---	---	60	90	90	150	100	150	108	---	---	---
Sheet metal work	---	---	---	---	---	---	---	---	8	12	---	---	---	---
Pattern making and moulding	---	---	---	---	60	90	---	---	---	---	---	---	---	---
Turning	---	---	54	81	---	---	---	---	---	---	---	---	180	135
Fourth Year														
Drawing	90	135	36	54	90	135	90	150	72	108	---	120	180	135
Line shading	---	---	---	---	5	8	5	8	---	---	5	---	---	---
Shade and shadows	---	---	---	---	40	60	10	17	---	---	20	---	---	---
Perspective	---	---	---	---	20	30	15	25	---	---	20	---	20	15
Architectural drawing	90	135	---	---	25 or	37	60	100	72	108	45 or	---	160	120
Machine drawing	---	---	36	54	25	---	---	---	---	---	45	---	---	---
Shopwork	90	135	54	81	90	135	90	150	108	162	---	162	---	---
Pattern making	---	---	54	81	---	---	---	---	---	---	---	---	---	---
Machine shop practice	90	135	---	---	90	135	90	150	108	162	108	---	---	---

TABLE IV

TABLE SHOWING TRAINING, EXPERIENCE, AND SALARIES OF TEACHERS OF MANUAL TRAINING

Class A—Teachers holding degrees received from schools outside of Texas.
Class B—Teachers holding degrees received from schools in Texas.
Class C—Teachers holding diplomas received from schools outside of Texas.
Class D—Teachers holding diplomas received in Texas.
Class E—Teachers holding no diploma or degree but with professional training.
Class F—Teachers who have no professional training.

School	No. of teachers in class						No. of teachers with experience of					Average salary
	A	B	C	D	E	F	1 Yr.	2 Yrs.	3 Yrs.	4 Yrs.	More than 4	
Alamo Heights	---	---	1	---	---	---	1	---	---	---	---	$ 810
Austin	1	---	---	---	3	---	1	---	1	---	2	1012
Bay City	---	---	---	1	---	---	1	---	---	---	---	675
Beaumont	---	---	1	---	---	---	---	1	---	---	---	1000
Bishop	---	---	---	1	---	---	1	---	---	---	---	720
Bonham	---	1	---	---	---	---	1	---	---	---	---	720
Bryan	---	---	---	1	---	---	---	---	1	---	---	1200
Childress	---	---	---	1	---	---	---	1	---	---	---	675
Conroe	---	---	---	1	---	---	---	---	1	---	---	792
Cooper	---	---	---	1	---	---	1	---	---	---	---	---
Corpus Christi	---	---	1	---	---	---	1	---	---	---	---	1100
Cuero	---	---	---	---	1	---	---	---	---	1	---	1200

TABLE IV—*Continued*

School	No. of teachers in class						No. of teachers with experience of					Average salary
	A	B	C	D	E	F	1 Yr.	2 Yrs.	3 Yrs.	4 Yrs.	More than 4	
Dallas	2		1		2				1		4	1349
Denison	1								1			1100
El Paso			5		1		1			1	4	1300
Farwell			1						1			810
Fort Worth	2				1	1	1		1		2	975
Gainesville	1							1				1000
Hallettsville					1			1				720
Harrisburg				1					1			810
Harris County No. 21				1			1					630
Harris County No. 25				1				1				585
Hillsboro			1					1				1050
Honey Grove					1			1				900
Houston	1	1	3	2	7		5	1	2	1	5	899
Houston Heights			1					1				1000
Huntsville			1							1		942
Kaufman				1				1				585
Kerrville					1				1			810
Kingsville	1							1				900
Longview					1		1					675
Lufkin			1								1	810
Marshall					1						1	945
McKinney				1			1					720
Moore		1								1		900
Morrill			1				1					810
Navasota	1											1250
North Fort Worth			1								1	1225
Oak Cliff			1		1			1			1	1250
Ozona				1							1	900
Paris			1							1		1080
Pilot Point					1		1					675
Port Arthur			1							1		1250
San Angelo			1						1			1200
San Antonio		1		1	7		2	1	1	1	4	1230
San Marcos				1					1			1140
Sherman			1	1							1	837
Silverton					1		1					675
South Park				1							1	
State Orphans Home					1		1					675
Sulphur Springs	1									1		900
Sweetwater			1								1	
Taylor				1						1		1008
Teague				1				1				810
Texarkana			1					1				900
Texas City			1							1		1100
Uvalde					1						1	1100
Waxahachie		1						1				900
Wichita Falls			1						1			1125
Winnsboro						1					1	810
	11	5	28	21	38	2	25	17	15	11	32	$ 54639

100 teachers reported from 62 schools.
The average salary paid the 97 teachers reported is $974.56.
22 teachers receive salaries between $ 675 and $ 800.
26 teachers receive salaries between 800 and 950.
11 teachers receive salaries between 950 and 1100.
31 teachers receive salaries between 1100 and 1400.
4 teachers receive salaries between 1400 and 1800.
3 teachers receive salaries between 1800 and 2000.

TABLE IV—Continued

TRAINING, EXPERIENCE, AND SALARIES OF TEACHERS OF DOMESTIC ECONOMY

School	No. of teachers in class						No. of teachers with experience of					Average salary
	A	B	C	D	E	F	1 Yr.	2 Yrs.	3 Yrs.	4 Yrs.	More than 4	
Alamo Heights				1				1				$ 720
Bay City				1			1					585
Beaumont				2	1							726
Bishop					1							630
Bonham				1					1			765
Buna		1					1					630
Carrizo Springs				1			1					700
Childress				1				1				675
Cisco				1				1				
Cleburne					1			1				800
Conroe				1					1			585
Corsicana	1								1			810
Corpus Christi					2							765
Cotulla	1							1				1080
Cuero	1										1	1000
Dallas Main High School	1		1	2			1				2	1187
Denison			2	1			1		2			855
Denton				1				1				675
Eagle Lake				1						1		675
El Paso	2	1	1		2		4	2	2		1	856
Fort Worth				1		2				1	2	858
Gatesville				1					1			585
Goldthwaite	1						1					630
Greenville			1						1			720
Harrisburg				1							1	540
Haskell	1								1			810
Hillsboro				1					1			675
Honey Grove				1				1				675
Houston			6				1	1	2		2	1031
Houston Heights			1						1			720
Indian Gap				1			1					675
Jacksonville				1						1		585
Jefferson				1			1					540
Jourdanton				1						1		540
Kaufman				1				1				585
Kingsville				1				1				720
Lubbock				1				1				540
Lufkin					1							540
Marshall	1								1			720
McKinney				1				1				630
Mineola				1			1					500
Morrill				1			1					720
Navasota				1				1				720
North Fort Worth				1						1		630
Oak Cliff			1	1						1	1	1050
Paris				1							1	900
Pilot Point			1	1			1					450
Pittsburg		1							1			675
Port Arthur			1							1		720
Rhome				1								450
San Angelo			1	1			1		1			670
San Antonio			3	3	1	4	4	3		2	4	908
San Benito				1							1	675
San Marcos			1				1					900
Sherman			2				1	1				787
Silverton				1			1					585
South Park				1				1				
Stamford		1							1			900
State Orphans Home				1				1				720
Sulphur Springs			1							1		675
Sweetwater				1								
Teague				1							1	720
Terrell				1			1					540

TABLE IV—*Continued*

School	No. of teachers in class						No. of teachers with experience of					Average salary
	A	B	C	D	E	F	1 Yr.	2 Yrs.	3 Yrs.	4 Yrs.	More than 4	
Texarkana	1	---	---	---	---	---	---	1	---	---	---	765
Texas City	---	---	---	1	---	---	---	---	1	---	---	810
Throckmorton	---	---	---	1	---	---	1	---	---	---	---	630
Tyler	---	1	---	---	---	---	---	---	1	---	---	810
Uvalde	---	---	---	1	---	---	---	---	1	---	---	675
Waxahachie	---	---	---	---	1	---	---	---	---	---	1	1000
Weatherford	---	---	---	1	---	---	1	---	---	---	---	675
Wichita Falls	1	---	---	---	---	---	---	---	---	---	1	945
Winnsboro	---	---	---	1	---	---	---	---	---	---	1	675
	11	5	23	55	10	6	27	21	21	10	20	$ 49668

110 teachers reported from 72 schools.
The average salary paid the 107 teachers reported is $3679.
41 of the 110 teachers reported are graduates of the College of Industrial Arts.

TABLE V

NORMAL SCHOOLS AND COLLEGES

MANUAL TRAINING DEPARTMENTS

School	Floor Space for						Value of Equipment			
	Drawing room	Bench wood shop	Wood working machinery	Forge shop	Machine shop	Total floor space	Drawing	Benches and tools	Wood working machinery	Metal working equipment
Southwest Texas State Normal	1200	1800	1000	----------	673	4022	$300	$700	$2000	$1500
Sam Houston Normal Institute	900	*396 1092	96	700	1200	6100	600	$900	$3600	$100
North Texas State Normal	1562	*200 1828	1875	1288	1875	10665	800	1800	3400	2025*
College of Industrial Arts	960	2240	960	440	440	5040	$300	$1500	$1900	$200
University of Texas	----------	1106	----------	----------	----------	1250	$ 89	$ 364	----------	----------

School	Instruction				Enrollment of students with Manual Training as the major subject			
	Year started	No. of M.T. instructors 1915-16	Student assistants	Salaries of instructors	1913-14	1914-15	Summer 1915	No. of students completing the full course
Sam Houston Normal Institute	1909	1	1	$1800	32	22	21	30
Southwest Texas State Normal	1010	1	0	$1800	30	40	20	25
North Texas State Normal	----------	1	3	1810	----------	----------	----------	37
College of Industrial Arts	1908	3	1	3500	200	290	20	----------
University of Texas	1913	1	0	2000	----------	----------	9	0

*When fully equipped the total value of M. T. equipment will be about $25,000.00.

TABLE VI

NORMAL SCHOOLS AND COLLEGES

DOMESTIC ECONOMY DEPARTMENTS

School	Sq. ft. of Floor Space for						Value of Equipment			
	D. S. labs.	Dining room	Model kitchen	Chemical lab.	D. Arts rooms	Total for D. E.	D. S. Labs.	Serving	D. A. Lab.	Other D. E. Equipment
Sam Houston Normal Institute	1092 *648	248	248	1155	1053	4444	$ 700	$ 275	$ 900	$ 150
Southwest Texas State Normal	1451	360	108	1875	2596	4515	400	275	800	535
North Texas State Normal	759	550	200	739	1247	3515*	1900	350	725	200
College of Industrial Arts	2377	803	124		4677	8677	4118	1128	3792	3173
University of Texas	1125	336		1303	862	3627	1664	715	476	1338

School	Instruction				Enrollment of students taking D. E. Course			
	Year started	No. of Instructors 1915	No. of student assistants 1915	Salaries	1913-14	1914-15	Summer 1915	No. of students completing full D. E. Course
Sam Houston Normal Institute	1909	2	0	$ 2,700	106	86	30	92
Southwest Texas State Normal	1910	2	1	3,380	80	73	51	0
North Texas State Normal								112
College of Industrial Arts	1903	15	4	18,600	D. S. 426 D. A. 451	D. S. 445 D. A. 490	D. S. 51 D. A. 80	D. S. 78 D. A. 84
University of Texas	1912	5		10,000			37	7**

*When fully equipped the total for D. E. will be about $5,000.
**The number of students who have completed 4 courses.